

**SIEMENS**

# SFH620AA/AGB

## 5.3 kV TRIOS® Optocoupler

### AC Voltage Input

**FEATURES**

- High Current Transfer Ratios  
at 5 mA: 50–600%  
at 1 mA: 45% typical (>13)
- Low CTR Degradation
- Good CTR Linearity Depending on Forward Current
- Isolation Test Voltage, 5300 VAC<sub>RMS</sub>
- High Collector-Emitter Voltage, V<sub>CEO</sub>=70 V
- Low Saturation Voltage
- Fast Switching Times
- Field-Effect Stable by TRIOS (TTransparent IOn Shield)
- Temperature Stable
- Low Coupling Capacitance
- End-Stackable, .100"(2.54 mm) Spacing
- High Common-Mode Interference Immunity (Unconnected Base)
- Underwriters Lab File #52744
- VDE 0884 Available with Option 1
- SMD Option, See SFH6206 Data Sheet

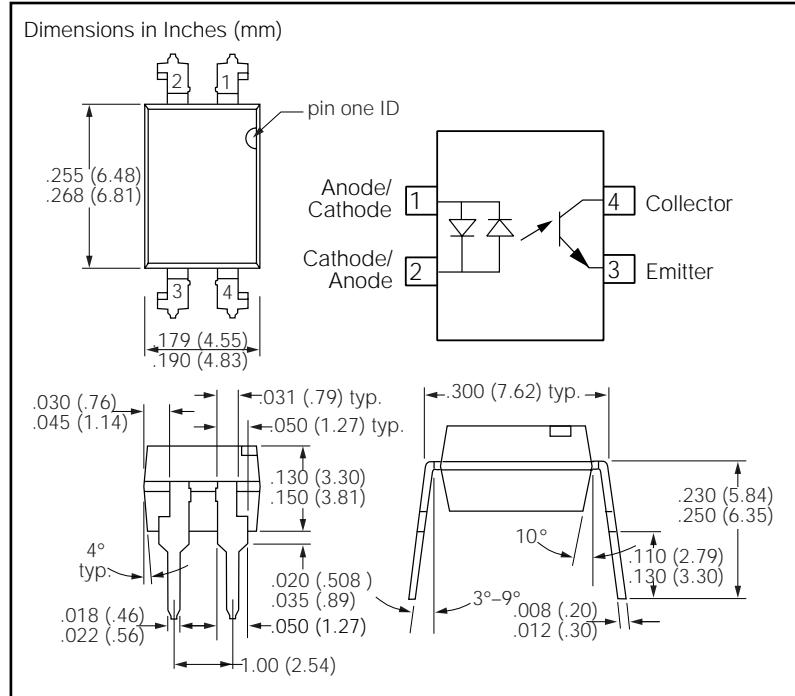
**DESCRIPTION**

The SFH620AA/AGB features a high current transfer ratio, low coupling capacitance and high isolation voltage. These couplers have a GaAs infrared emitting diode emitter, which is optically coupled to a silicon planar phototransistor detector, and is incorporated in a plastic DIP-4 package.

The coupling devices are designed for signal transmission between two electrically separated circuits.

The couplers are end-stackable with 2.54 mm spacing.

Creepage and clearance distances of >8 mm are achieved with option 6. This version complies with IEC 950 (DIN VDE 0805) for reinforced insulation up to an operation voltage of 400 V<sub>RMS</sub> or DC.

**Maximum Ratings****Emitter**

Reverse Voltage .....	±60 mA
Surge Forward Current (t <sub>p</sub> ≤10 μs) .....	±2.5 A
Total Power Dissipation .....	100 mW

**Detector**

Collector-Emitter Voltage .....	70 V
Emitter-Collector Voltage .....	7 V
Collector Current .....	50 mA
Collector Current (t <sub>p</sub> ≤1 ms) .....	100 mA
Total Power Dissipation .....	150 mW

**Package**

Isolation Test Voltage between Emitter and Detector, refer to Climate DIN 40046, part 2, Nov. 74 .....	5300 VAC <sub>RMS</sub>
Creepage .....	≥7 mm
Clearance .....	≥7 mm
Insulation Thickness between Emitter and Detector .....	0.4 mm
Comparative Tracking Index per DIN IEC 112/VDEO 303, part 1 .....	175
Isolation Resistance	
V <sub>IO</sub> =500 V, T <sub>A</sub> =25°C .....	≥10 <sup>12</sup> Ω
V <sub>IO</sub> =500 V, T <sub>A</sub> =100°C .....	≥10 <sup>11</sup> Ω
Storage Temperature Range .....	-55 to +150°C
Ambient Temperature Range .....	-55 to +100°C
Junction Temperature .....	100°C
Soldering Temperature (max. 10 s. Dip Soldering Distance to Seating Plane ≥1.5 mm) .....	260°C

### Characteristics ( $T_A=25^\circ\text{C}$ )

Description	Symbol		Unit	Condition
<b>Emitter</b>				
Forward Voltage	$V_F$	1.25 ( $\leq 1.65$ )	V	$I_F=\pm 60 \text{ mA}$
Capacitance	$C_0$	50	pF	$V_R=0 \text{ V}, f=1 \text{ MHz}$
Thermal Resistance	$R_{thJA}$	750	K/W	
<b>Detector</b>				
Capacitance	$C_{CE}$	6.8	pF	$V_{CE}=5 \text{ V}, f=1 \text{ MHz}$
Thermal Resistance	$R_{thJA}$	500	K/W	
<b>Package</b>				
Collector-Emitter Saturation Voltage	$V_{CESAT}$	0.25 ( $\leq 0.4$ )	V	$I_F=10 \text{ mA}, I_C=2.5 \text{ mA}$
Coupling Capacitance	$C_C$	0.2	pF	

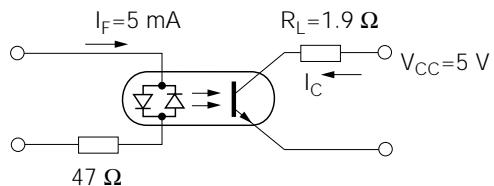
Note: 1. Still air, coupler soldered to PCB or base.

### Current Transfer Ratio ( $I_C/I_F$ at $V_{CE}=5 \text{ V}$ ) and Collector-Emitter Leakage Current

Description	AA	AGB	Unit
$I_C/I_F$ ( $I_F=\pm 5 \text{ mA}$ )	50–600	100–600	%
Collector-Emitter Leakage Current, $I_{CEO}$ $V_{CE}=10 \text{ V}$	10 ( $\leq 100$ )	10 ( $\leq 100$ )	nA

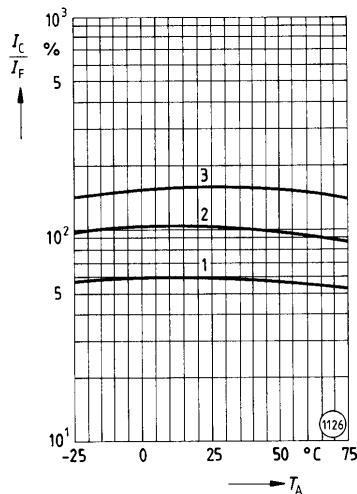
### Switching Times (Typical Values)

#### Linear Operation (saturated)

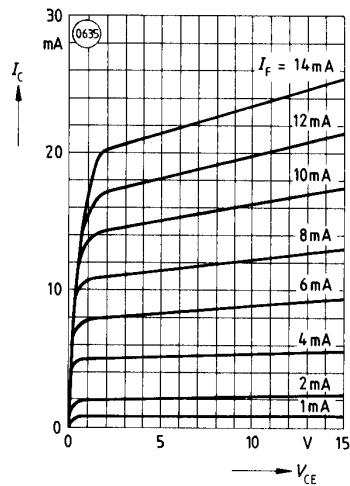


Turn-on Time	$t_{ON}$	2.0	$\mu\text{s}$
Turn-off Time	$t_{OFF}$	25	$\mu\text{s}$

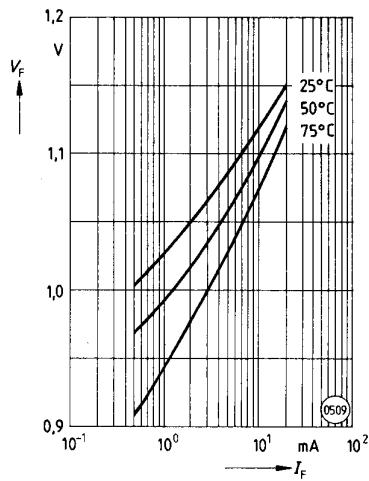
**Figure 1. Current transfer ratio (typ.) vs. temperature**  
 $I_F = 10 \text{ mA}$ ,  $V_{CE} = 5 \text{ V}$



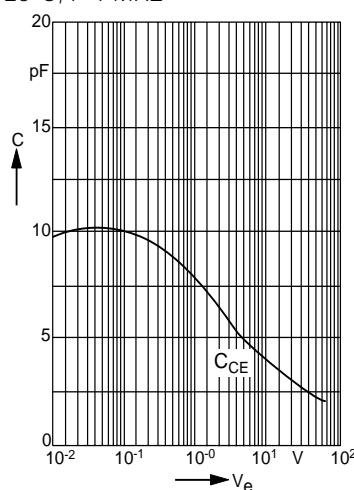
**Figure 2. Output characteristics (typ.) Collector current vs. collector-emitter voltage  $T_A = 25^\circ\text{C}$**



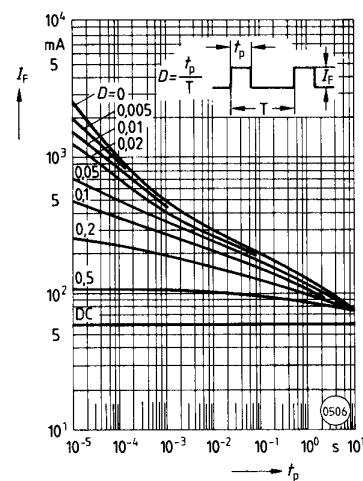
**Figure 3. Diode forward voltage (typ.) vs. forward current**



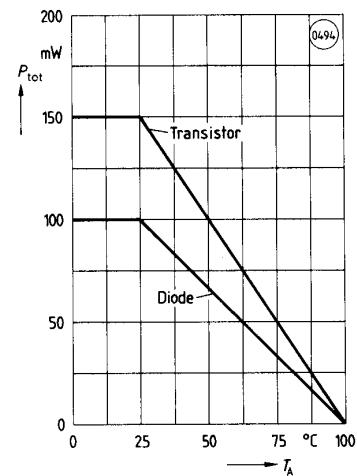
**Figure 4. Transistor capacitance (typ.) vs. collector-emitter voltage**  
 $T_A = 25^\circ\text{C}$ ,  $f = 1 \text{ MHz}$



**Figure 5. Permissible pulse handling capability. Fwd. current vs. pulse width**  
Pulse cycle D=parameter,  $T_A = 25^\circ\text{C}$



**Figure 6. Permissible power dissipation vs. ambient temp.**



**Figure 7. Permissible diode forward current vs. ambient temp.**

